# AB1A

# HAM RADIO DIPOLES

## APPROXIMATE WIRE LENGTH BASED ON MHz FREQUENCY

* Reference ARRL Band Plan for more info *
* many factors will change the lengths shown.*
* Use these dimensions as general reference only *

## CUT WIRE LONGER THAN SHOWN : TRIM TO LENGTH AS REQ'D

* PLOT SWR readings on chart, measure often trim off SHORT lengths of wire to tune as req'd*
* If the SWR on Upper Band Freq. is higher>than that on LOWER Band, your antenna is too LONG. *
* If the SWR on Lower Band Freq. is higher>than that on UPPER Band, your antenna is too SHORT. *

* Dipoles should be one full wave length + above ground for max low angle DX *
* However most people don't got the means to get dipoles antennas that high. *

Antennas, hung at correct heights is BEST WAY to IMPROVE your Signal Reports

* a 2 element yagi antenna gets the most DB gain for the least amount aluminum *
* look up "Moxon" folded 2 element yagi antenna especially for portable use *

* Near Vertical Incidence Skywave (NVIS) it's not a DX antenna, Look up NVIS *
* it can be AWESOME regional - state communication antenna. ONLY for 80, 60 & 40 meters *
* Dipole wire length 80m = 58'-4", 60m 43'-0" & 40m = 32'-4" *

1/8" = 1'-0" scale
IF printed on 24"x36" paper
drawn by Mike Christeson AB1A


Last updated with
8-18-2018 revision
4-19-2019 revision
6-6-2019 revision
2-20-2020 revision
10-20-2020 revision
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## END FED 1/2 WAVE WIRE ANTENNA

NOTE: ALWAYS tune END FED antennas on lowest band first
66 feet = (792") 40-20-15-10 Meters using a 49:1 Balun
NOTE: 17m & 12m not harmonically related

132 feet = (1,584") 80-40-20-17-15-10 Meters using a 49:1 Balun
NOTE: 60m & 30m Require Tunner and on some parts of 80m

259 feet = (3,108") 160-80-40 Meters using a 49:1 Balun
NOTE: 60m Require Tunner and on some parts of 160 & 80m

## 160 meter
LOWER SIDE BAND

Min. DX Dipole Height (60% wave)
311'-0" or 3,732" above ground

Ham 1.800 = 260'-0"
260'-0" | 130'-0" | 130'-0" | 1560"

Mid Band Ham 1.900
246'-3 3/4" | 123'-2" | 123'-2" | 1478" | .82"

Ham 2.000 = 234'-0"
234'-0" | 117'-0" | 117'-0" | 1404" | .74" | 13'-0"

CENTER FEED POINT

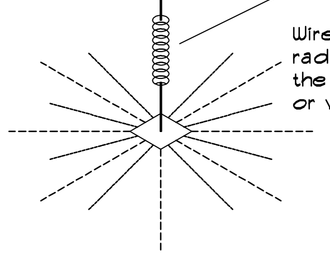
63'-1 3/4"

TELESCOPING ANTENNA
17'-0" (16.5 feet) = 198" inches or 1/4 wave 20 meter antenna
9'-0" (8.5 feet) = 102" inches
6'-0" (5.5 feet) = 66" inches

Vertical Antenna
(telescopic 198" or 102" or 66" Antenna)

Loading Coil
(note more Efficient IF can be located in center)

Wire Counter Poise
radials 1/4 Freq length 32 ideal QTY
the more number of radial wires the better ground / recieve
or vehicle metal body / other large metal object



WOLF RIVER COILS
Silver Bullet Mini (40- 10M)-
- approx. 24'-0" or 288" coil of wire
Silver Bullet (80- 10M)
- approx. 58'-0" or 696" coil of wire
verify length

22.5 degrees with 16 wire example = 400ft

33'-0" wire x 8 radials = 264 feet required
40meter 1/4 wave

17'-0" wire x 8 radials = 136 feet required
20meter 1/4 wave

## 80 meter
LOWER SIDE BAND

Ham 3.500 | code only | Ham 3.600
133'-8 1/2" | 66'-10 1/4" | 66'-10 1/4" | 802 1/4"

MID BAND HAM 3.800
123'-2" | 61'-7" | 61'-7" | 739" | 63 1/4"

Ham 4.000
117'-0" | 58'-6" | 58'-6" | 702" | 37" | 8'-4 1/4"

Min. DX Dipole Height (60% wave)
155'-0" or 1,860" above ground

CENTER FEED POINT

Note wire difference in length from from bottom to top of bands ,especially for 160 & 80 meters
This is WHY its hard to cut a dipole that can be used across the entire band

## 60 meter
UPPER SIDE BAND

HAM 5.330.5 | HAM 5.346.5 | HAM 5.357.0 | HAM 5.371.5 | HAM 5.403.5

87'-9 1/4" | 43'-10 1/2" | 43'-10 1/2" | 526 1/2" | 14'-7 1/2" | 175 1/2"
87'-4 1/4" | 43'-8" | 43'-8" | 524"
86'-7" | 43'-3 1/2" | 43'-3 1/2" | 519 1/2" | 7"

Min. DX Dipole Height (60% wave)
110'-0" or 1,320" above ground

CENTER FEED POINT

## 40 meter
LOWER SIDE BAND

Ham 7.000 | code only | Ham 7.125
66'-10 1/4" | 33'-5 1/4" | 33'-5 1/4" | 401 1/4" | 9'-10 1/2" | 118 1/2" | 33'-5"

MID BAND HAM 7.150
65'-5 1/2" | 32'-8 3/4" | 32'-8 3/4" | 392 3/4" | 8 1/2"

HAM 7.300
64'-1 1/4" | 32'-0 3/4" | 32'-0 3/4" | 384 3/4" | 16 1/2"

Min. DX Dipole Height (60% wave)
83'-0" or 996" above ground

CENTER FEED POINT

## 30 meter

Ham 10.100 | Mid Band Ham 10.125 | Ham 10.150
46'-2 1/2" | 23'-1 1/4" | 23'-1 1/4" | 277 1/4"

Min. DX Dipole Height (60% wave)
57'-0" or 684" above ground

CENTER FEED POINT

## 20 meter
UPPER SIDE BAND

Ham 14.000 | code only | Ham 14.150
33'-5 1/4" | 16'-8 1/2" | 16'-8 1/2" | 200 1/2" | 16'-8 1/2"

MID BAND HAM 14.175
33'-0 1/4" | 16'-6" | 16'-6" | 198" | 2 1/2"

Ham 14.350
32'-7 1/4" | 16'-3 3/4" | 16'-3 3/4" | 195 3/4" | 5"

Min. DX Dipole Height (60% wave)
42'-0" or 504" above ground

CENTER FEED POINT

## 17 meter
UPPER SIDE BAND

HAM 18.068 | code only | Ham 18.110
25'-10 3/4" | 12'-11 1/2" | 12'-11 1/2" | 155 1/2"

MID BAND HAM 18.118
25'-10" | 12'-11" | 12'-11" | 155"

HAM 18.168
25'-9" | 12'-10 1/2" | 12'-10 1/2" | 154 1/2"

Min. DX Dipole Height (60% wave)
33'-0" or 396" above ground

## 15 meter
UPPER SIDE BAND

Ham 21.000 | code only | Ham 21.200
22'-3 1/2" | 11'-1 3/4" | 11'-1 3/4" | 133 3/4"

mid band Ham 21.225
22'-0 1/2" | 11'-0 1/4" | 11'-0 1/4" | 132 1/4"

Ham 21.450
21'-9 3/4" | 10'-11" | 10'-11" | 131"

Min. DX Dipole Height (60% wave)
28'-0" or 336" above ground

## 12 meter
UPPER SIDE BAND

Ham 24.890 | code only | Ham 24.930
18'-9 1/2" | 9'-4 3/4" | 9'-4 3/4" | 112 3/4"
18'-9 1/4" | 9'-4 1/2" | 9'-4 1/2" | 112 1/2"

Ham 24.990
18'-8 3/4" | 9'-4 3/8" | 9'-4 3/8" | 112 3/8"

Min. DX Dipole Height (60% wave)
24'-0" or 288" above ground

## 11 meter
10-4 GOOD BUDDY

CB CH 1= 26.965
17'-4 1/4" | 8'-8 1/4" | 8'-8 1/4" | 104 1/8"

MID CB - CH 20= 27.205
17'-0" | 8'-6" | 8'-6" | 102"

CB CH40= 27.405
17'-0 1/4" | 8'-6 1/8" | 8'-6 1/8" | 102 1/8"

CENTER FEED POINT

## 10 meter
UPPER SIDE BAND

Ham 28.000 | code only | Ham 28.300
16'-8 1/2" | 8'-4 1/4" | 8'-4 1/4" | 100 1/4"
16'-6 1/2" | 8'-3 1/4" | 8'-3 1/4" | 99 1/4"

Ham 28.700
16'-3 3/4" | 8'-1 3/4" | 8'-1 3/4" | 97 3/4"

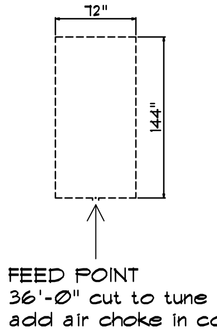
Ham 29.200
16'-0 1/4" | 8'-0 1/4" | 8'-0 1/4" | 96 1/4"

Ham 29.700
15'-9" | 7'-10 1/2" | 7'-10 1/2" | 94 1/2"

Min. DX Dipole Height (60% wave)
21'-0" or 252" above ground

### 10 Meter Rectangular Loop

Has about 2.1 DB Gain (low angle) over Dipole
when hang well above ground. # 12 gauge wire
Rectangular loop can be scaled up to 12 & 17 meters etc




FEED POINT
36'-0" cut to tune
add air choke in coax line

## 2 meter

HAM 144.00 | 39"
MID HAM - 146.000 | 38½"
HAM 148.000 | 38"

## 6 meter
UPPER SIDE BAND

HAM 50.100
9'-4" | 4'-8" | 4'-8" | 56"

MID HAM - 52.000
9'-0" | 4'-6" | 4'-6" | 54"

HAM 54.000
8'-8" | 4'-4" | 4'-4" | 52"

Min. DX Dipole Height (60% wave)
11'-0" or 132" above ground

The common formula for calculating wavelength in feet is: wavelength = 984 / frequency in MHz
* If the SWR on upper Band Frequency is higher than that on lowest band freq your antenna is too LONG. *
* If the SWR on lowest Band Freq. is higher than that on upper Band Freq, your antenna is too SHORT. *